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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/526,602	03/16/2000	Yasuharu Suda	54490-Z/JPW/DVD	1592

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EXAMINER
RODEE, CHRISTOPHER D

ART UNIT	PAPER NUMBER
1756	20

DATE MAILED: 07/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/526,602	Applicant(s) SUDA ET AL.	
	Examiner Christopher D RoDee	Art Unit 1756	

-- The MAILING DATE of this communication appears on th cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 July 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1 July 2003 has been entered.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 21-24 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hou in US Patent 5,358,822 in view of either Senga *et al.* in US Patent 4,873,166 or Kawanishi *et al.* in US Patent 4,032,463, still further in view of JP 58-152258.

Hou has been discussed throughout prosecution as disclosing a process of making a liquid toner. In the process of Example 2 a thermoplastic polymer (see patent claim 1) and a pigment (e.g., carbon black - an inorganic pigment) are placed in a solvent that is a good solvent for the polymer at high temperatures and a poor solvent at lower temperatures. The carbon black in Hou meets the requirements of both a coloring agent and inorganic particles because it is both of these. Thus a single component meets the requirements of each claimed component. The polymer and pigment are heated to a temperature of 70 °C where the polymer is dissolved and then cooled to 0 °C so the polymer precipitates with the pigment. The

precipitated polymer particles are removed from the solvent and then redispersed in ISOPAR and mixed with cupric naphthenate along with a steric stabilizer (apparently a dispersant). The reference discloses cupric naphthenate and zirconium octoate (i.e., zirconium octylate) as alternative charge control agents (col. 12, l. 12-20). The reference states that either organic or inorganic colorants may be used in the process. The colorants, such as a pigment, are either embedded in the particle or are attached to the surface of the particle (col. 7, l. 5-22). Hou shows concern for the particle size of the produced polymer particles and states that the process of the reference gives small and uniform particles (col. 8, l. 62+).

Although the reference does not mentioned the solubility parameter of the solvent, it is apparent from the disclosure and would be understood by the artisan that the solubility parameter is chosen do that the polymer will dissolve out of the solvent and form either a coating on the pigment or a particle with the pigment embedded. The artisan would understand that the solubility parameter would control the size of the formed polymer particle. This is evidenced by the supporting references to Senga and Kawanishi, both directed to the formation of liquid developers having resin (i.e., polymer) particles (col. 2, l. 31-34). Senga states, "The particle diameter depends mostly on solubility parameter of the produced polymer and solvents and so the particle diameter can be controlled by suitable selection of them." (col. 5, l. 33-36) Kawanishi discusses the relationship of the solubility parameter of a polymer and the solvent in the formation of a developer having polymer particles. This reference teaches that size of the toner particles is controlled by judicious choice of the polymer solubility parameter with reference to the solubility parameter of the liquid (col. 1, l. 47 - col. 2, l. 57; col. 3, l. 26-36).

The reference does not state that the polymer is substantially insoluble in the solvent at room temperature however it is apparent that the resin is insoluble in the solvent at a temperature of 0 °C or above because the resin particle are formed by cooling using a cooling

bath of 0 °C. Further the resin's solubility temperature (i.e., the temperature at which it changes from being soluble to insoluble) is below 70 °C because this is the temperature where the polymer is in a dissolved state and mixed as seen in the Example.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to choose a combination of polymer and solvent in Hou so that the polymer is insoluble in the solvent at room temperature because the reference states that cooling of the resin solution occurs at a high cooling rate (col. 6, l. 21-22) and the mixture is cooled to 0 °C. This would suggest that the resin's solubility temperature in the solvent is at a higher temperature than the cooling bath temperature of 0 °C because small particles are desired (Abstract). In order to form small particles the artisan would want to move quickly through the solubility temperature (i.e., drop the temperature quickly past the solubility temperature) because a slow progression through the solubility temperature would cause more resin to deposit on and with the pigment particles. Fine particles would be more difficult to form. No criticality is given for the solubility temperature in the reference other than the requirement that it be at or above 0 °C. Thus the artisan would have been expected to choose a temperature for the solubility temperature of the resin in the solvent that would aid formation of fine particles. A temperature higher than 0 °C would, therefore, have been obvious. A solubility temperature at room temperature or above but below 70 °C (the temperature where the polymer is shown to be soluble) would have been obvious because room temperature is far above the cooling bath temperature and small (i.e., fine) particles would have been expected to form readily during the rapid cooling step.

The artisan would have found it obvious to control the solubility parameter of the polymer and the solvent because the supporting references teach that the particle diameter of the polymer is a result effecting variable in control of the polymer particle size. Because Hou is

specifically concerned with polymer particle size in the liquid developer and the supporting references teach that polymer and solvent solubility parameter control particle size, the artisan would have found it obvious to optimize the solubility parameter of the polymer and solvent to obtain the desired particle size in Hou.

Applicant's remarks in the RCE filing have been carefully considered. The newly applied secondary references establish that the difference in solubility parameter of a polymer and solvent are known to control the size of the polymer particles. The art clearly suggests the limitation in claim 21 concerning the relationship of SP value of the solvent and the polymer and particle size of the resultant resin particle (response pp., 7-8). The Examiner by the new ground of rejection has fully responded to applicant's position.

Applicant also traverses the rejection because Hou does not disclose that a resin can be substantially insoluble in a solvent under some conditions and not others. Applicant notes that Example 2 cools the resin to 0 °C to achieve precipitation, which suggests that the resin is soluble in the solvent at room temperature. Applicants take the position that one of skill in the art could not choose a combination of resin and organic solvent where the resin cannot be dissolved at room temperature but can be dissolved at high temperatures.

The Examiner has carefully considered this position but cannot agree with applicant's position. Hou clearly shows that the artisan is able to choose a resin that will be insoluble in a solvent in one temperature but soluble at a higher temperature. The reference clearly indicates that such determinations are well within the level of skill in the art. The artisan would have been expected to choose a solubility temperature between that of the ice bath (0 °C) and the mixing temperature (70 °C) because the polymer must solidify at a temperature within this range. The choice of a specific temperature in this range would have been obvious for the reasons given above. Additionally, the rejection has been modified as noted above concerning this feature.

The solubility parameter is not identified in the claims as identifying the resin that cannot be dissolved at room temperature as asserted in the response. The claim states that the solubility parameter controls the size of the produced toner particle. This feature is taught by the supporting art as discussed above. There is also no requirement that an electric viscous fluid is formed (response p. 9) nor is there any indication that Hou's liquid developer does not have these features.

The rejection is proper as now presented and is applicable to the rejected claims.

Claims 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hou in US Patent 5,358,822 in view of either Senga *et al.* in US Patent 4,873,166 or Kawanishi *et al.* in US Patent 4,032,463 as applied to claims 21-24 and 28 above, and further in view of Sato *et al.* in US Patent 3,808,026.

Hou, Senga, and Kawanishi are described above. The references do not disclose silica and titanium oxide as a component of the toner. Sato discloses silica and titanium oxide as a white pigment in a liquid toner (col. 4, l. 50-60). These pigments are effective for forming an image that is non-contrasting with the image background (col. 2, l. 54 - col. 3, l. 21).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use silica or titanium oxide as the pigment in the liquid toner of Hou because a white pigment in the toner allows for development of the image background (i.e., surface of the paper - col. 3, l. 9-13). Development of the background area on the photoreceptors permits neutralization of background charges and allows clear images to be formed. It appears that silica would have hydroxide groups attached to its surface because silica is a hydrophilic substance. ~~What~~ Water absorbed on the silica surface would give hydroxide groups.

Applicant is understood to traverse this rejection because it is not seen as disclosing the control of particle size by solubility parameter. Applicant is correct that this feature is not taught by Sato. However, Hou, Senga, and Kawanishi do teach that the particle size of a toner particle is controlled, at least in part, by the solubility parameter of the resin and solvent. These references properly teach the feature asserted to be missing from the rejection.

The rejection is proper as described above and for the reasons given in the base rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher D RoDee whose telephone number is 703 308-2465. The examiner can normally be reached on most weekdays from 6 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 703 308-2464. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872-9310 for regular communications and 703 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308-0661.

CHRISTOPHER RODEE
PRIMARY EXAMINER

cdr
July 15, 2003